

AMENDMENT NO. 1 NOVEMBER 2012
TO
IS 15852 : 2009 TEXTILES — WOVEN SHIRTINGS MADE OF COTTON,
MAN-MADE FIBRES/ FILAMENTS AND THEIR BLENDS — SPECIFICATION

(First cover page, Title) — Substitute the following for the existing title:

‘TEXTILES — POLYESTER BLENDED WOVEN SHIRTING FOR UNIFORMS’

(Second cover page, FOREWORD, para 2 and 3) — Substitute the following for the existing:

‘Uniform fabrics are used to a large extent by military, navy, air force, paramilitary, security, police, postal, Indian railways, industrial and corporate personnel, etc, and must have certain minimum constructional parameters to meet the durability and functional requirements in addition to aesthetics and comfort properties. Polyester and viscose/cotton blended fabrics provide all such required properties. This standard has been formulated keeping these facts in view and supersedes IS 7085 : 1986 ‘Specification for polyester blend shirtings — Market varieties (*first revision*)’, IS 11815 : 1986 ‘Specification for polyester blend shirtings for uniforms’ and IS 11881 : 1986 ‘Specification for men’s and boy’s woven shirting made of man-made fibres and their blends’. Opportunity has also been taken to update various performance requirements of woven shirting for uniforms and new performance requirements of limited flame spread index, soil release efficiency and anti-bacterial activity value have been incorporated.

The standard makes reference to Stain Release Replica which is available from AATCC, USA.

The Committee has reviewed the provisions of the following International Standard referred in this standard and has decided that it is acceptable for use in conjunction with this standard:

<i>International Standard</i>	<i>Title</i>
ISO 20743 : 2007	Textiles — Determination of antibacterial activity of antibacterial finished products

The composition of the Committee responsible for the formulation of this standard is given in Annex E.’

(Page 1, Title) — Substitute for the existing title:

‘TEXTILES — POLYESTER BLENDED WOVEN SHIRTING FOR UNIFORMS’

(Page 1, clause 1) — Substitute the following for the existing:

‘1 SCOPE

1.1 This standard specifies the requirements for woven polyester and viscose/cotton blended shirting for uniforms generally used by military, paramilitary, navy, air force, security, police, postal, industrial and corporate personnel, etc.

1.2 This standard does not specify general appearance, feel, shade, etc, of the fabric.’

(Page 1, clause 3.1, sentence 2) — Delete.

(Page 1, Table 1) — Substitute the following table for the existing Table 1:

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Table 1 Requirements for Polyester Blended Woven Shirting
(Clause 4.1)

Sl No. (1)	Characteristic (2)	Requirement (3)	Method of Test, Ref to IS/Annex of this standard (4)
i)	Nominal count of warp and weft yarns (For guidance only)	12 tex (50s)	IS 3442
ii)	Length, m	As agreed (No minus tolerance)	IS 1954
iii)	Overall width, cm	90 cm or as agreed ± 1 cm	IS 1954
iv)	Threads/dm:		IS 1963
	a) Warp	440 ^{+5%} -2.5%	
	b) Weft	360 ^{+5%} -2.5%	
v)	Mass, g/m ²	102 ^{+5%} -2.5%	IS 1964
vi)	Fibres composition, percent :		IS 3416 (Part 1)
	a) Polyester	67 $\pm$ 3 units	
	b) Viscose/cotton	Remainder	
vii)	Breaking strength on 5 cm $\times$ 20 cm strip, N (kgf), <i>Min</i> :		IS 1969 (Part 1)
	a) Warpway	440 (44.9)	
	b) Weftway	350 (35.7)	
viii)	Tear strength, N (kgf), <i>Min</i> :	IS 6489	
	a) Wrap way	10 (1.0)	
	b) Weft way	9 (0.9)	
ix)	Dimensional stability to dry heat at 150 $\pm$ 2° C, percent, <i>Max</i> :		IS 12170
	a) Warp way	1.0	
	b) Weft way	1.0	
x)	Soil release efficiency, <i>Min</i> :		Annex C
	a) Initial (Finished)	Stain release Grade 5	
	a) After 50 washes	Stain release Grade 5	
xi)	Crease recovery angle in dry state, degrees, <i>Min</i> (Initially and after three repeated washes)	240°	IS 4681
xii)	Pilling resistance, <i>Min</i> (After 5 h of test)	4	IS 10971 (Part 1)
xiii)	Dimensional change on washing, percent, <i>Max</i> :		Annex D
	a) Warpway	2	
	b) Weftway	2	
xiv)	Abrasion resistance 5 000 rubs (Martindale method)	There shall not be any breakage of two threads of the fabric	IS 12673
xv)	pH value of aqueous extract (Hot method)	6.0 - 8.0	IS 1390
xvi)	Minimum colour fastness ratings to:		
	a) Light (change in colour)	5	IS 686 or IS 2454
	b) Washing: Test C (3):		IS/ISO 105-C10
	1) Change in colour	4	
	2) Staining of adjacent fabrics	3-4	
	c) Dry-heat at 150 $\pm$ 2° C (Change in colour)	4	IS 4636
	d) Perspiration (acidic and alkaline):		IS 971
	1) Change in colour	4	
	2) Staining of adjacent fabric	4	

Sl No. (1)	Characteristic (2)	Requirement (3)	Method of Test, Ref to IS/Annex of this standard (4)
	e) Rubbing:		IS 766
	1) Dry	4	
	2) Wet	3	
	f) Hot pressing at $150 \pm 2^\circ \text{C}$ for 15 s in dry state:		IS 689
	1) Change in colour	4	
	2) Staining of adjacent fabrics	4	

(Page 2, clause 3.2.1, sentence 3) — Substitute the following for the existing:

‘It shall also be heat set and fully shrunk’.

(Page 2, clause 4.2) — Substitute the following for the existing:

‘4.2 Limited Flame Spread Requirement

If agreed to between the buyer and the seller, the shirting shall meet the requirements of limited flame spread Index 2 as specified in IS 15742 and when tested in accordance with IS 15758 (Part 4) with the flame applied to the bottom edge of the specimen’.

(Page 2, clause 4.2) — Insert the following new clauses after 4.2:

‘4.3 Anti-Bacterial Activity Value

If agreed to between the buyer and the seller, the suiting shall have anti-bacterial activity value (initially and after 30 washes) greater than 1 when tested by the absorption method prescribed in ISO 20743. The fabric shall be washed as per the procedure specified in C-5.1.

4.4 Sealed Sample

If in order to illustrate or specify the indeterminable characteristics, such as general appearance, luster, feel and shade of the shirting, a sample has been agreed upon and sealed, the supply shall be in conformity with the sample in such respect.

4.4.1 The custody of the sealed sample shall be a matter of prior agreement between the buyer and the seller.’

(Page 3, Annex A) — Substitute the following for the existing annex:

ANNEX A

(Clause 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	Title
105-C10 : 2006	Textiles — Tests for colour fastness: Part C10 colour fastness to washing with soap or soap and soda
686 : 1985	Methods for determination of colour fastness of textile materials to daylight (<i>first revision</i>)

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<i>IS No.</i>	<i>Title</i>
689 : 1988	Methods for determination of colour fastness of textile materials to hot pressing (<i>first revision</i>)
766 : 1988	Method for determination of colour fastness of textile materials to rubbing (<i>first revision</i>)
971 : 1983	Method for determination of colour fastness of textile materials to perspiration (<i>first revision</i>)
1390 : 1983	Methods for determination of pH value of aqueous extracts of textile materials (<i>first revision</i>)
1954 : 1990	Determination of length and width of woven fabrics — Methods (<i>second revision</i>)
1963 : 1981	Methods for determination of threads per unit length in woven fabrics (<i>second revision</i>)
1964 : 2001	Textiles—Methods for determination of mass per unit length and mass per unit area of fabrics (<i>second revision</i>)
1969 (Part 1) : 2009	Textiles — Tensile properties of fabrics — Determination of maximum force and elongation at maximum force: Part 1 Strip method (<i>third revision</i>)
2194 : 1963	Code for seaworthy packaging of man-made fibre fabrics
2195 : 1964	Code for inland packaging of man-made fibre fabrics and man-made fibre yarns
2454 : 1985	Methods for determination of colour fastness of textile materials to artificial light (Xenon lamp) (<i>first revision</i>)
3416 (Part 1) : 1988	Method for quantitative chemical analysis of binary mixture of polyesterfibres with cotton or regenerated cellulose: Part 1 Sulphuric acid method (<i>second revision</i>)
3442 : 1980	Method for determination of crimp and count of yarn removed from fabrics (<i>first revision</i>)
4055 : 1966	Specification for maize (corn) oil
4636 : 1988	Method for determination of colour fastness of textile materials to dry-heat treatments (excluding pressing) (<i>first revision</i>)
4681 : 1981	Method for determination of recovery from creasing of textile fabrics by measuring the angle of recovery (<i>first revision</i>)
4905 : 1968	Methods for random sampling
6359 : 1971	Method for conditioning of textiles
6489 (Part 1) : 2011	Textiles — Tear properties of fabrics: Part 1 Determination of tear force using ballistic pendulum method (elmendorf) (<i>second revision</i>)
10099 : 1982	Methods for preparation, marking and measuring of fabric specimens and garments in tests for determination of dimensional change
10971 (Part 1) : 2011	Textiles — Determination of fabric propensity to surface fuzzing and to pilling: Part 1 Pilling box method (<i>first revision</i>)
12170 : 1987	Method for determination of dimensional stability of textile materials to dry heat treatments
12673 : 1989	Textiles fabric — Abrasion resistance — Methods for determination
14452 : 1997	Textiles — Care labelling code using symbols
15370 : 2005	Textiles — Domestic washing and drying procedures for textile testing
15742 : 2007	Textiles — Requirements for clothing made of limited flame spread materials and material assemblies affording protection against heat and flame — specification
15758 (Part 4) : 2007	Textiles — Protective clothing: Part 4 Test method for limited flame spread

(Page 5, Annex B) — Insert ‘Annex C’ and ‘Annex D’ after ‘Annex B’ and renumber the existing ‘Annex C’ as ‘Annex E’.

ANNEX C

[Table 1, SI No. (x)]

METHOD OF TEST FOR SOIL RELEASE: OILY STAIN RELEASE METHOD

C-1 PRINCIPLE

A stain is applied to a test specimen. An amount of the staining substance is forced into the fabric by using a specified weight. The stained fabric is then laundered in a prescribed manner and the residual stain rated on a scale from 5 to 1 by comparison with a stain release replica showing a graduated series of stains.

C-2 APPARATUS AND MATERIALS

C-2.1 White Blotting Paper

C-2.2 Corn oil (*See IS 4055*)

C-2.3 Glassine Paper or Equivalent

C-2.4 Timer

C-2.5 Weight, cylinder 6.4 cm diameter, 2.268 ± 0.045 kg (stainless is preferable).

C-2.6 Amber bottle, with medicine dropper.

C-2.7 Washer, automatic as specified in IS 15370.

C-2.8 Dryer, automatic as specified in IS 15370.

C-2.9 Granular commercial detergent, home wash as specified in IS 15370.

C-2.10 Ballast of $(92 \times 92) \pm 3$ cm hemmed pieces of bleached cotton sheeting (Ballast wash load Type 1) or 50 / 50 polyester / cotton bleached mercerized plain weave (Ballast wash load Type 3).

C-2.11 Lighting and Evaluation Area

C-2.12 Table with non-glare black top 61×92 cm and 89 ± 3 cm high.

C-2.13 Stain Release Replica

C-2.14 Thermometer, 0 to 100°C , Least count - 1°C

C-2.15 Balance or scale appropriate for the weights required having a least count of 0.01 g.

C-3 TEST SPECIMENS

Use two test specimens $(38 \times 38) \pm 1$ cm for each determination. Condition the test specimens for a minimum of 4 h at $27 \pm 2^{\circ}\text{C}$ and 65 ± 5 percent RH prior to application of stains.

C-4 STAINING PROCEDURE

C-4.1 Place the unstained specimen flat on a single thickness of white textile blotting paper on a smooth, horizontal surface.

C-4.2 Using the medicine dropper, place 5 drops (approximately 0.2 ml) of corn oil in the approximate center of the test specimen.

C-4.3 Place a 7.6×7.6 cm of glassine paper over the stained area.

C-4.4 Place the weight (*see C-2.5*) on the glassine paper over the stained area.

C-4.5 Allow weight to sit undisturbed for 60 ± 5 s. Then removed the weight and discard the glassine sheet.

C-4.6 Do not allow stained test specimens to contact each other in a manner which would transfer stains. Wash within 20 ± 5 min after staining.

C-5 WASHING PROCEDURE

C-5.1 Subject the specimens to washing as per procedure 5A and reference detergent specified in **4.1.2** of IS 15370 and followed by drying as per **8.5** of IS 15370.

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C-5.2 Remove specimens from dryer immediately on completion of the cycle and lay flat to prevent formation of wrinkles or creases which can affect the stain release rating. Rate residual stains within 4 h after drying.

C-6 EVALUATION

C-6.1 Mount the stain release replica on the mounting board, with the centre of the standard 114 ± 3 cm from the floor.

C-6.2 Place the test specimen flat with face up in the center of the non-glare black topped table with one edge of the table touching the mounting board. The fabric shall be rotated to be viewed from the direction which produces the lowest rating.

C-6.3 Viewing distance shall be 76 ± 3 cm from the back mounting board, with the eye at 157 ± 15 cm from the floor. The rater should stand directly in front of the specimen. Varying the viewing angle either horizontally or vertically can affect grades obtained on the same fabrics.

C-6.4 Each rater shall independently compare the residual stain on the test specimen with the stains on the stain release replica and rate each test specimen to the nearest 0.5 grade as follows:

- Grade 5 — Stain equivalent to Standard Stain 5
- Grade 4 — Stain equivalent to Standard Stain 4
- Grade 3 — Stain equivalent to Standard Stain 3
- Grade 2 — Stain equivalent to Standard Stain 2
- Grade 1 — Stain equivalent to Standard Stain 1

NOTE — Grade 5 represents the best stain removal and Grade 1 the poorest stain removal.

C-7 Report

C-7.1 Calculate the average of 4 grades for each fabric (2 judgments on each of 2 specimens), to nearest 0.1. This is the unit of measure for this test method.

C-7.2 Report whether the stain release replica or the 3 M stain release rating scale was used.

C-7.3 Report water hardness of the washing procedure in terms of parts per million (ppm).

C-7.4 Report the type ballast material used.

ANNEX D

[Table 1, Sl No. (xiii)]

METHOD OF TEST FOR DETERMINATION OF DIMENSIONAL CHANGE IN WASHING AND DRYING

D-1 PRINCIPLE

The specimen of known dimensions is conditioned in the standard atmosphere and subjected to the appropriate washing and drying procedures. After drying and conditioning, the specimen is re-measured and the changes in dimensions are calculated.

D-2 APPARATUS AND REAGENTS

Use apparatus and reagents as specified in IS 10099 and IS 15370.

D-3 ATMOSPHERIC CONDITIONS

The atmospheric conditions required for conditioning and testing are specified in IS 6359.

D-4 TEST SPECIMENS

D-4.1 The selection, dimensions, marking and measuring of test specimens are specified in IS 10099.

D-4.2 Two specimens from each sample should be taken.

D-5 PROCEDURE

D-5.1 Take two specimen and condition these as per IS 6359. Determine the original length and width dimensions in accordance with IS 10099.

D-5.2 Subject the specimens to washing using the reference detergent specified in 4.1.2 of IS 15370 and as per procedure 5A specified in 7.1 of IS 15370 and then dry the specimens as per 8.5 of IS 15370.

D-5.3 After washing and drying, condition and measure the specimens and calculate the dimensional change of the specimens according to the procedure specified in IS 10099.

D-6 EXPRESSION OF RESULTS

D-6.1 Calculate the average change in dimensions in both the length and width directions in accordance with IS 10099 as follows:

$$= \frac{X_t - X_o}{X_o} \times 100$$

where

X_o = original dimension; and

X_t = dimension measured after treatment.

Record the changes in measurement separately as a percentage of the corresponding original value.

D-6.2 Express the average dimensional changes to the nearest 0.5 percent.

D-6.3 State whether the dimension has decreased (shrinkage) by means of a minus sign (-) or increased (extension) by means of a plus sign (+).